

Project No. 060539.1
September 18, 2006

John Wingate
Senior Engineer
TN & Associates, Inc.
317 East Main Street
Ventura, California 93001

Subject: **Compaction Report for the Treatment Compound Building Pad**
5050 East Slauson Avenue
Maywood, California

Dear Mr. Wingate:

As requested, Twining Laboratories of Southern California, Inc. (Twining Laboratories) has provided geotechnical observations and testing services during fill placement following the over excavation for the treatment compound building pad at 5050 East Slauson Avenue in Maywood, California. This report presents the summary of our geotechnical observations and testing results for work conducted on August 4, 2006.

SCOPE OF SERVICES

Work performed by Twining Laboratories, as described herein, was limited to geotechnical services, which consisted of geotechnical observations, laboratory testing, and field compaction testing for the subject treatment compound building pad.

OBJECTIVES

The purpose of the geotechnical services was to observe and document the following during construction:

- Observation of depth and limits of overexcavation for the new service building;
- Observation of the bottom of excavation prior to fill placement; and
- Observation and compaction testing during fill placement.

GEOTECHNICAL CONSTRUCTION OBSERVATIONS

A soil technician from Twining Laboratories was on site to provide continuous observation and monitoring during fill placement following the overexcavation for the treatment compound building pad. The treatment compound building pad excavation limits were approximately 60 feet wide, 90 feet long and 4 feet deep. Soils excavated during the removal operations consisted predominately of silty sand.

SOIL TYPES AND LAB TEST RESULTS

The type of soils used as fill material for this project consisted of on-site silty sand to sandy silt (SM/ML). The maximum dry density and optimum moisture content relationships for the on-site, including their descriptions, are presented on the table presented below. The laboratory standard of compaction used was in conformance with the latest edition of ASTM D 1557.

Maximum Dry Density, Optimum Moisture, and Soil Description of Fill Material (ASTM D 1557)

Sample No.	Soil Type	Source	Soil Description	Maximum Dry Density (pcf)*	Optimum Moisture (%)*
1	SM	On Site Soil	Silty Sand, Brown	117.0	11.5
2	SM	On Site Soil	Silty Sand, Brown	116.0	11.0
3	SM	On Site Soil	Silty Sand, Brown	116.0	12.0

Note:

* The maximum dry density and optimum moisture values represent the corrected values due to rock correction, as appropriate.

A number 200 sieve wash and Atterberg limits testing were performed on sample No.1. The sample tested contained approximately 37.3 percent fines and a plasticity index (PI) of 0.

FILL PLACEMENT

Subsequent to the excavation, the bottom of the excavation was observed by the Twining Laboratories soil technician and was considered geotechnically suitable for placement of fill. The bottom of the excavation consisted of native silty sand.

The bottom was scarified and compacted to 94 to 95 percent of the maximum dry density. Fill soil was placed in approximately 10- to 12- inch-thick loose lifts, and compacted to at least 95 percent of the maximum dry density as determined by ASTM D 1557. Backfill soils were compacted by relatively heavy rubber-tired loader with a full bucket.

SOIL DENSITY TESTING PROCEDURES

In-place density tests were performed in accordance with latest version of ASTM D 2992 (Nuclear Gauge Method). Fill soils were also probed between test locations. The results of in-place density tests are presented on the attached Table 1, Results of Compaction Tests and the location of the in-place density tests are shown in Figure 1, Site Location Map.

SUMMARY

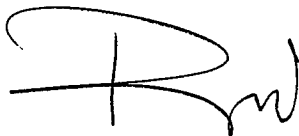
The excavation and compaction operations, as well as geotechnical observations and testing services described herein, have been limited to those operations performed on August 4, 2006. Based on our geotechnical observations and testing, it is our opinion that the excavation and backfilling operations were performed in general conformance with the standards of geotechnical practice in southern California. The backfill, where tested, was compacted to at least 95 percent of the maximum dry density. One test, = test # 5 near the center of the pad, which was performed at the bottom of the overexcavation (4 feet below final grade), resulted in a relative compaction of 94 percent of the maximum dry density.

LIMITATIONS

This report is intended for use with regard to the specific project discussed herein. Services performed by Twining Laboratories were conducted in accordance with generally accepted geotechnical engineering principles and practices. No other warranty, expressed or implied, is made. Geotechnical testing services provided by Twining Laboratories allow the testing of only a small percentage of the fill placed at the project site. Therefore, testing by Twining Laboratories during backfilling does not relieve the General Contractor, or their sub-contractors of their primary responsibility to perform all work in accordance with the requirements of the regulating agencies, local jurisdictions, and the project requirements.

Respectfully submitted,

TWINING LABORATORIES OF SOUTHERN CALIFORNIA, INC.



A. Shafiq Popalzai
Staff Engineer



Paul C. Soltis, R.C.E. 56140, G.E. 2606
Senior Engineer



Attachments:

Figure 1 Site Location Map

Distribution:

Original File Copy – 1
John Wingate – 3

Table-1
In-Place Density Test Results (ASTM D 1556)

Test No.	Test Type	Date	Approximate Depth From Finish Surface (ft)	Soil Type	Field Moisture (%)	Field Dry Density (pcf)	Optimum Moisture (%)	Maximum Dry Density (pcf)	Relative Compaction (%)	Relative Compaction Required (%)	Remarks
1	NG	08/04/06	-4	SM	7.5	109.8	12.0	116.0	95	95	Pass
2	NG	08/04/06	-4	SM	7.5	112.2	11.5	117.0	96	95	Pass
3	NG	08/04/06	-4	SM	8.0	110.3	12.0	116.0	95	95	Pass
4	NG	08/04/06	-4	SM	6.0	111.1	12.0	116.0	96	95	Pass
5	NG	08/04/06	-4	SM	7.5	109.4	12.0	116.0	94	95	Fail
6	NG	08/04/06	-2	SM	7.5	109.7	12.0	116.0	95	95	Pass
7	NG	08/04/06	-2	SM	8.5	113.1	11.0	116.5	97	95	Pass
8	NG	08/04/06	-2	SM	9.5	109.8	12.0	116.0	95	95	Pass
9	NG	08/04/06	-2	SM	8.5	111.0	12.0	116.0	96	95	Pass
10	NG	08/04/06	-2	SM	8.5	111.0	11.0	116.5	95	95	Pass
11	NG	08/04/06	0	SM	10.5	111.7	11.5	117.0	95	95	Pass
12	NG	08/04/06	0	SM	10.0	112.9	11.5	117.0	96	95	Pass
13	NG	08/04/06	0	SM	6.0	110.9	12.0	116.0	96	95	Pass
14	NG	08/04/06	0	SM	9.0	110.4	12.0	116.0	95	95	Pass
15	NG	08/04/06	0	SM	9.5	109.8	12.0	116.0	95	95	Pass

Notes:

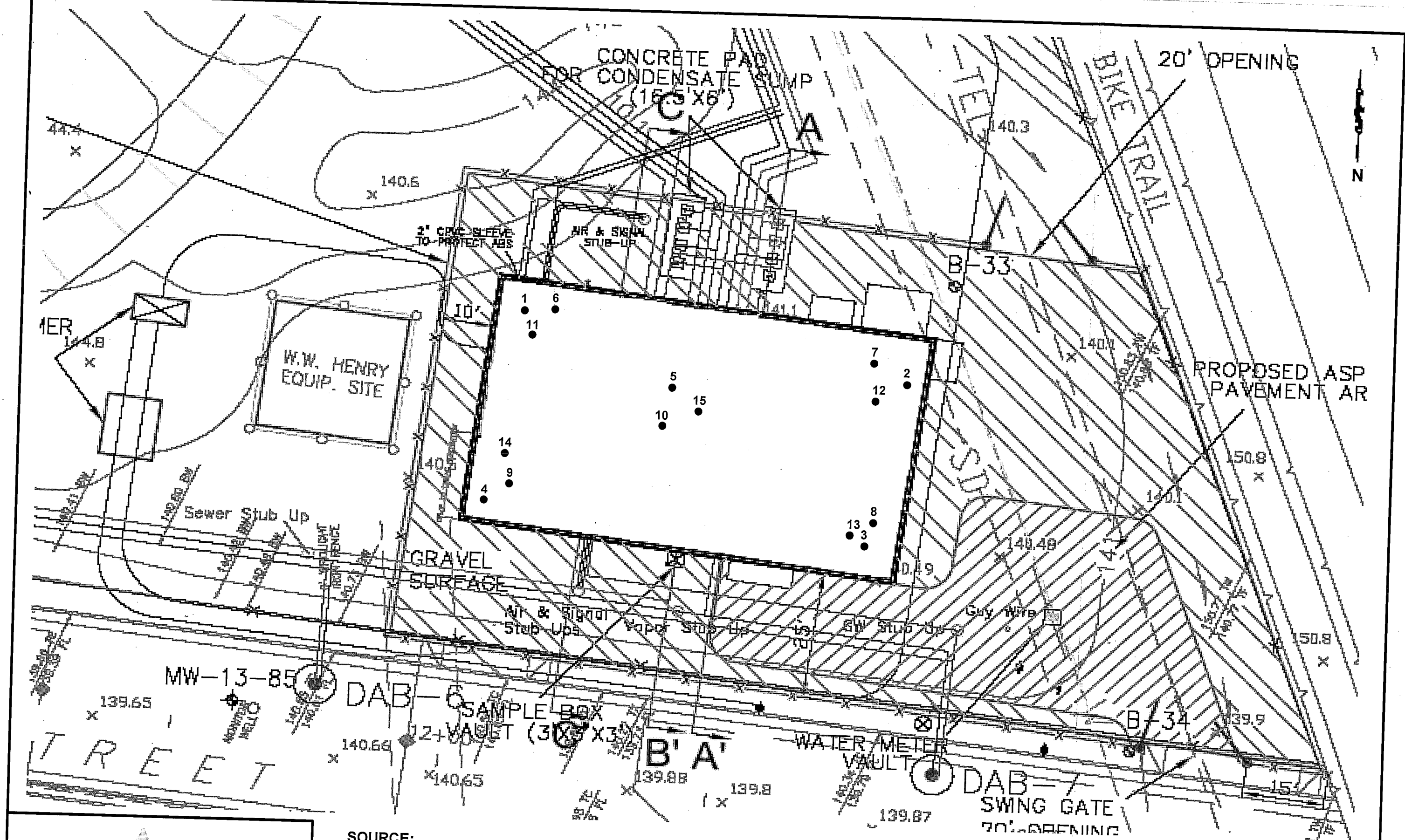
FSG = Finish Subgrade

* = Failing Test

A = Failing Test Location Re-Worked and Re-Tested

NG = Nuclear Gauge Method (ASTM D 2992)

SC = Sand Cone Method (ASTM D 1556)



**TWINING
LABORATORIES**
OF SOUTHERN CALIFORNIA

SOURCE:

Reproduced from T N & Associates, Inc. Treatment Compound Subslab Plan

EXPLANATIONS:

- Number and approximate location of in-place density tests (ASTM D 2992)

SITE PLAN

Pemaco Remedial Action
5050 East Slauson Avenue
Maywood, California

PROJECT NO
060539.1

REPORT DATE
SEPTEMBER 2006

FIGURE 1